

CLAIMS

1. A method for generating and processing images for use in dentistry, characterized in that it comprises the steps of: acquiring the position of at least one first reference surface, associated with at least one portion of either the upper dental arch or the lower dental arch of a patient, and of at least one second reference surface, which is associated with at least one portion of the other of said upper and lower dental arches and/or with a handpiece operated by a health operator inside the mouth of the patient; transducing the acquired positions of said first surface and of said second surface into signals to be transmitted to an electronic processing unit, in which CAD software is implemented; processing, with said processing unit, the transmitted signals in order to generate an image for use in dentistry; and displaying said image on a screen.

2. The method according to claim 1, characterized in that said acquisition step comprises the emission of electromagnetic radiation from said first and second surfaces and the reception of the emitted radiation.

3. The method according to claim 1, characterized in that said acquisition step comprises the emission of electromagnetic radiation toward said first and second surfaces and the reception of the radiation reflected/absorbed by said first and second surfaces.

4. The method according to one or more of the preceding claims, characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch and said second surface is associated with at least one portion of the other of said upper and lower dental arches, in order to generate an image that represents the relative motion between said maxilla and said mandible for gnathological analyses of occlusion and/or of the kinematics/dynamics of mastication and/or for generating a gnathological interarch device and/or for integrating the creation of prostheses with correct occlusal adjustment.

30 5. The method according to one or more of the preceding claims,

characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch and said second surface is associated with a handpiece of the probe type in order to create a three-dimensional image of the state of said portion before a dental 5 procedure.

6. The method according to one or more of the preceding claims, characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch and said second surface is associated with a handpiece, of the tool and/or probe type, for 10 generating a three-dimensional image of the application site of a prosthesis, formed in said portion, in order to produce said prosthesis.

7. The method according to one or more of the preceding claims, characterized in that said first surface is associated with at least one portion of either said upper dental arch or said lower dental arch and said second 15 surface is associated with a handpiece of the tool type for generating a three-dimensional image of the relative position of said handpiece with respect to said portion for the assisted preparation of said application site.

8. The method according to claim 7, characterized in that it comprises the steps of: defining a first reference axis in said portion for preparing said 20 application site and a second reference axis of said handpiece; acquiring the relative position of said second axis with respect to said first axis; comparing the acquired relative position with predefined limit reference positions stored in said electronic processing unit; and indicating the straying of said acquired relative position beyond said limit reference 25 positions.

9. The method according to claim 8, characterized in that said relative position is defined by the angle of incidence formed by said first and second axes, said limit reference positions being defined by the maximum or minimum breadth of said angle of incidence.

30 10. The method according to one or more of claims 7 to 9,

characterized in that it comprises detecting the amount of material removed by the tool handpiece from the tooth or osteointegrated implant being worked in said portion and/or the height thereof; comparing said acquired quantity and/or height respectively with a predefinable maximum reference value and with a predefinable minimum reference value; and indicating the straying of said acquired quantity and/or height beyond said maximum and minimum reference values.

11. The method according to one or more of the preceding claims, characterized in that said electromagnetic radiation belongs to the infrared range.

10 12. The method according to one or more of the preceding claims, characterized in that it comprises storing said images in a memory unit associated with said processing unit.

13. The method according to one or more of the preceding claims, characterized in that it comprises processing at least the image of said application site and/or the image that represents the relative motion between said maxilla and said mandible in order to generate, with said CAD, the three-dimensional model respectively of said prosthesis and/or of a gnathological interarch device.

20 14. The method according to one or more of the preceding claims, characterized in that it comprises processing the image of said application site and of at least one image selected from the group that comprises:

- the image of the portions of the upper dental arch or of the lower dental arch that are adjacent thereto;
- 25 -- the image of the portions of the upper dental arch or lower dental arch that are antagonist thereto;
- the image of the state of the portion of the upper dental arch or lower dental arch in which it is formed, before the creation of said site;
- 30 -- the image that represents the relative motion between the maxilla

and the mandible;

-- the image or images of a database of models of teeth, or others; in order to create, with said CAD, the three-dimensional model of said prosthesis with a shape suitable to reproduce or modify the occlusal relationship with said adjacent and/or antagonist portions and/or reproduce or modify the state of the portion of the upper or lower dental arch in which said application site is formed prior to the creation of said site.

15. The method according to one or more of the preceding claims, characterized in that it comprises the steps of: transmitting said model of said prosthesis or of said gnathological prosthesis to an auxiliary electronic processing unit in which CAM software is implemented; extrapolating from said model the coordinates for controlling and actuating an electronically-controlled modeling unit; and transmitting said coordinates to said modeling unit in order to manufacture said prosthesis or said gnathological prosthesis.

16. The method according to one or more of the preceding claims, characterized in that said electronic processing unit and said auxiliary electronic processing unit mutually coincide.

17. The method according to one or more of the preceding claims, characterized in that said modeling unit is a unit for milling a block of material.